

CLAIMS

What is claimed is:

1. An apparatus comprising:
 - a shell;
 - an optical reflector disposed at least partially within the shell, wherein a space is formed between the optical reflector and the shell;
 - at least one light emitting diode disposed within the optical reflector;
 - a heat sink disposed at least partially within the shell, the light emitting diode being mounted to the heat sink; and
 - a motor and a fan in flow communication with the space, the fan being configured to move air over the heat sink and through the space.
2. The apparatus of Claim 1, wherein the fan is configured to move air over the heat sink before moving air through the space.
3. The apparatus of Claim 1, wherein the shell has at least one air inlet aperture, the fan drawing air through the air inlet aperture.
4. The apparatus of Claim 3, wherein the shell and optical reflector define at least one air exhaust aperture, wherein air is expelled through the at least one air exhaust aperture after moving over the heat sink.
5. The apparatus of Claim 3, wherein the shell further has at least one air exhaust aperture, wherein air is expelled through the at least one air exhaust aperture after moving over the heat sink.
6. The apparatus of Claim 1, wherein the shell and optical reflector define at least one air inlet aperture and the shell further has at least one air exhaust aperture, wherein the fan draws air through the air inlet aperture and moves air through the space, over the heat sink and through the air exhaust aperture.

7. The apparatus of Claim 3, wherein the apparatus further comprises a base coupled to the shell, wherein the shell has a plurality of air inlet apertures located near the base.
8. The apparatus of Claim 1, wherein the heat sink includes at least one of a plurality of fins and a plurality of heat pipes that extend into the space.
9. The apparatus of Claim 1, wherein the motor and fan are within the shell.
10. The apparatus of Claim 1, further comprising a hollow neck coupled to the shell and a base coupled to the hollow neck, wherein the motor and fan are within the base.
11. A method of cooling a light emitting diode in a lamp, the lamp including an optical reflector that directs the light emitted from the light emitting diode, the method comprising:
 - drawing air through at least one air inlet aperture;
 - moving the air over a heat sink that is coupled to the light emitting diode;
 - moving the air along at least a portion of the optical reflector; and
 - expelling the air through at least one air exhaust aperture.
12. The method of Claim 11, wherein the air is moved along at least a portion of the optical reflector before the air is moved over the heat sink.
13. The method of Claim 11, wherein moving the air along at least a portion of the optical reflector comprises moving the air through a space defined by the optical reflector and an external shell that surrounds at least a portion of the optical reflector.
14. The method of Claim 11, wherein drawing air, moving the air over a heat sink, moving the air along at least a portion of the optical reflector, and expelling the air is performed by a fan.

15. The method of Claim 11, wherein air is expelled through at least one air exhaust aperture defined by the optical reflector and an external shell that surrounds at least a portion of the optical reflector.
16. The method of Claim 11, further comprising moving the air through a hollow element that supports the optical reflector and a base that is coupled to the hollow element.
17. An apparatus comprising:
 - a light emitting diode;
 - an optical reflector that controls the direction of light emitted from the light emitting diode;
 - a heat sink, the light emitting diode being mounted on the heat sink;
 - a fan for moving air over the heat sink; and
 - an air flow channel through which the fan moves air, the air flow channel follows the general outline of the optical reflector.
18. The apparatus of Claim 17, wherein the air flow channel is at least partially defined by the optical reflector.
19. The apparatus of Claim 18, further comprising an exterior shell in which the optical reflector is at least partially disposed, wherein the air flow channel is further defined by the exterior shell.
20. The apparatus of Claim 19, wherein the exterior shell has a plurality of apertures through which air is drawn prior to being moved over the heat sink.
21. The apparatus of Claim 17, wherein the heat sink comprises at least one of a plurality of fins and a plurality of heat pipes that extend in the general direction of the optical reflector.

22. The apparatus of Claim 17, further comprising a hollow support element that is coupled to the optical reflector and heat sink, wherein the hollow support element defines a portion of the air flow channel.